

ANNUAL REVIEW 1988



HABITAT
CONSERVATION
FUND

A Message From the Minister of Environment

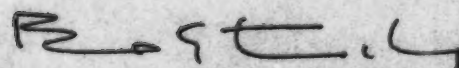
This is a success story!

The Habitat Conservation Fund, started as an innovative concept in B.C. in 1981, is now in the forefront of Canadian fish and wildlife habitat development programs. The credit for this success goes to the thousands of hunters, anglers, naturalists and other concerned citizens who have supported the idea with money, enthusiasm, concern and good wishes.

The results are many new and improved habitats. The Fund provides opportunities to experiment with new techniques and to improve tried-and-true methods of enhancement. It also adds a new dimension to our ability to protect, replenish, and manage our valuable fish and wildlife resource.

Many people are responsible for this success story but none more than the volunteer Public Advisory Board which reviews every submission and gives me the benefit of its wide and varied experience in the field of conservation.

Just as recent years were more productive than the first three, I am confident that in the coming years we will break more new ground in habitat conservation in British Columbia. This success story will continue with your support.



Bruce Strachan
Minister

British Columbia has a wealth of habitat that supports a wide variety of fish and wildlife. However, those habitats cannot be taken for granted, for they can be squandered carelessly and quickly. Unlike artificial environments such as zoos or aquariums, natural habitats cannot be created. We can, however, create the conditions that will improve or restore habitat in areas affected by human or other interference.

The Habitat Conservation Fund was established in 1981 to assist in the preservation and enhancement of fish and wildlife and their habitats throughout British Columbia. Through this Fund, money is raised and allocated to habitat acquisition, restoration and enhancement projects. Since the first project on the Cowichan River in 1981, the Fund has financed 174 fisheries and 226 wildlife enhancement projects. It has also been involved in the acquisition of more than 1200 hectares of valuable habitat.

All proceeds from the Habitat Conservation Fund are reinvested in Fund projects. This report contains a description of individual projects undertaken during the 1984/85 to 1987/88 period. In addition, it lists funds allocated to each project over its lifespan up to 1987/88.

One Fund: Three Accounts

The Habitat Conservation Fund consists of three accounts:

- ☐ enhancement
- ☐ acquisition
- ☐ compensation

The Enhancement Account

Up to the end of 1987/88 this account had acquired \$9,121,787. Most of this (\$8,611,835) was derived from a \$3 surcharge levied

on all angling, hunting, guiding and trapping licenses issued in the province. Donations, bequests, gifts from individuals and companies, interest income and other fund-raising activities accounted for the remaining \$509,952 revenue in this account.

Initially, most enhancement account projects were performed by Ministry of Environment staff. More recently the policy has been introduced of contracting

Protecting
the Future...
Now



Burrowing owl

the majority of the work to private agencies. This practice helps develop and sustain a reserve of private sector professionals who are proficient at undertaking a wide variety of conservation projects.

Since 1981, 400 projects have been approved and undertaken. From 1984/85 to 1987/88, 318 new and continuing projects were undertaken.

Of these, 140 involved fisheries habitat and 178 provided improvements to wildlife habitat. A joint venture, involving The Nature Trust of B.C., the Nature Conservancy of Canada, the East Kootenay Heritage Fund, and \$100,000 contribution

a four-hectare parcel which included the entire catchment basin of Bourassa Spring to ensure protection of the water supply for the Skaha hatchery.

The Acquisition Account

In the first three years of the Habitat Conservation Fund program, nearly \$1 million from the Crown Land Fund Account was spent on

out, and a small interpretation centre constructed. A second project in the same area restored a trout spawning habitat near Island Lake, improving the trout fishery. Previously, mine activity had resulted in damage to other fish and wildlife habitat in the vicinity. More recently, angler access to the Thompson River was improved through the acquisition of 5.24 hectares at a cost of \$51,000.

Below: Wood duck

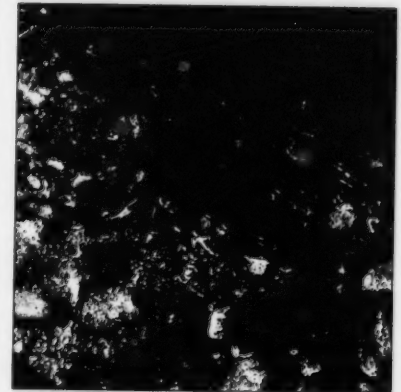


land acquisition. Fiscal restraint has since prevented the injection of further funding, but recent indicators suggest similar levels of funding may again become available.

The Compensation Account

This account accepts money from corporations and individuals as compensation for loss or degradation of fish or wildlife habitat due to detrimental impacts from development. The proceeds are used to acquire and/or enhance other habitats near the site where the development occurred. Contributions and interest have totalled \$415,159.

Contributions from a mining company were spent to improve and protect waterfowl habitat and improve a fishery near a mine. A small wetland near the village of Logan Lake was fenced, a nature trail laid



Above: Kokanee

Left: Whitetailed deer fawn

from the Habitat Conservation Fund, resulted in the cooperative purchase of Sheep Mountain in 1984/85. The fund also paid for an \$1,800 acquisition survey for Skaha Lake in 1985/86. Subsequently, \$65,000 was paid from the Recreational Fisheries Branch's main budget to acquire

Spawning habitat for kokanee in Peachland Creek was improved through another mining company's contribution to the compensation account. The two-year project cost \$25,000. In the two years since the project's completion, an estimated 100,000 additional kokanee fry returned to Okanagan Lake.

Selection of suitable and productive projects is a vital part of Habitat Conservation Fund

activities. Projects must have broad support from the majority of user groups. At the same time, one of the Fund's objectives is to implement a wide range of projects directed at benefiting a diversity of species.

A series of guidelines provides the basis for proposal evaluation:

- ☐ proposals must be technically sound;
- ☐ there must be reasonable likelihood of success;
- ☐ there must be minimum incidental negative effects on other species;
- ☐ innovative proposals must have some justification in the literature or in experimentation elsewhere;
- ☐ both long-term and short-term gains are most desirable, long-term returns are not ignored in favour of immediate returns;
- ☐ an ideal project is one where a small amount of money will do a lot of good for a long time.

Before project proposals are submitted to the Minister's Public Advisory Board for final evaluation and recommendation, they are subjected to careful scrutiny by Ministry of Environment technical staff to ensure they are technically sound, cost effective and meet policy guidelines.

The Public Advisory Board consists of ten people with a broad knowledge of fish and wildlife management. Board members have a sound understanding of the wishes and objectives of various public conservation organizations, and represent an optimal blend of business, legal, and scientific expertise.

Chaired by Dr. Ian McTaggart-Cowan, an internationally renowned wildlife biologist, the Board meets

regularly at various places around the province. Board members are volunteers who donate their time, effort, and expertise to the welfare of British Columbia habitat and the fish and wildlife that depend on it.

Members of the Board

Founding members appointed in 1981 were:

Nancy Anderson, naturalist and educator, New Denver

Dr. Bert Brink, retired UBC plant science professor, Vancouver

Lloyd Brooks, retired forester, park planner and former deputy minister, Victoria*

Tom Christy, guide outfitter, Lillooet*

Judge Leo Gansner, naturalist, Cranbrook

Barbara Nield, conservationist, Vancouver

Terry O'Brien, lawyer, Vancouver*

Tony Sevcik, photographer, Chilliwack*

Tommy Walker, author and former guide, Smithers*

* (Term completed 1987)

Project Selection



Bighorn sheep

In 1987, the Minister of Environment appointed five new Board members for two-year renewable terms. The new members are:

Huxley Lovely, retired photographer, Kamloops

John Simkins, financial manager, Prince George

Norman (Red) Sorenson, guide outfitter, Muncho Lake

George Tickell, businessmen, Maple Ridge

Clint Whitecotton, outdoorsman and photographer, Lumby

Recommendations of the Advisory Board are referred to Minister of Environment for final approval.



Yellow-headed blackbird

Better Habitat: Better Populations

The ultimate objective of habitat enhancement is increased abundance and diversity of native fish and wildlife species. This goal can be achieved through many means, from prescribed burning to lake aeration; from blasting debris from clogged streams to flooding marshlands for waterfowl.

The techniques used must suit the individual project and needs of the resident animals and the particular circumstances of the land or water to be affected. Different ecosystems require flexibility on the part of the designers and the field staff, who are continually learning from experience. Even after an appropriate technique is selected, it is fine-tuned and adapted to the specific project.

The complexity of the analysis and the prescribed remedy is apparent in the examples of artificial circulation (lake aeration) for fisheries and transplants of wildlife.

Artificial Circulation

Winter kill is a term that has become familiar to many people in British Columbia. It refers to fish kills that occur in some interior lakes due to oxygen deficits. Winter kill can be prevented by adding oxygen to problem lakes. This is done by using compressors to add oxygen to lakes when required, a solution that sounds deceptively simple.

Not all lakes need extra oxygen during the winter months; some lakes require treatment twice each year, while others must be aerated only at a critical time of year. Evaluating the lake's needs is an important part of the process, and may require monitoring for several years to provide conclusive information.

Once the extent of required aeration is determined, the appropriate method of conducting the task

has to be chosen from several available methods. Some of these rely on solar energy or wind to drive the compressors. Ease of installation, reliability, cost, available power source, winter access and proximity of maintenance personnel all have to be considered.

A follow-up study determines the success of the artificial circulation project. Evaluation is based on three criteria:

- ☐ amount of oxygen present during the winter;
- ☐ confirmed fish survival rates; and
- ☐ estimated angler success before and after project completion.

Upon project completion, cost/benefit analyses are performed to determine if the benefits of enhancement exceed the costs. The objective is to determine the minimum amount of aeration and the minimum cost required to prevent winter kill. Cost/benefit analyses have indicated that although large lakes are more expensive to aerate, they generally provide better long-term value.

The Habitat Conservation Fund has financed 21 artificial circulation projects around the province. These projects involved more than 600 hectares of water and have provided an abundance of fish for anglers. But biologists must be cautious in altering a cycle that occurs naturally. Higher year-round levels of oxygen in the water may promote a ripple effect throughout the ecosystem that could impact plant and animal life. Scientific research continues in this area.

Other fisheries enhancement projects made possible by the Fund include:

- ☐ clearing streams where debris prevents fish from reaching spawning or rearing areas;
- ☐ improving rearing habitat by adding boulders or logs to provide places for fish to rest, hide or feed;



Left: Bull moose

It is important to distinguish between transplants and introductions:

- ☐ Transplants involve animals that are native to the area and have lived there before.
- ☐ Introductions, on the other hand, usually involve animals, often from foreign countries, that would likely be an asset to the native wildlife population.

The Habitat Conservation Fund does not finance introductions, but it does support transplants.

One such transplant occurred in the Potato Mountain range between Tatlayoko and Chilko Lake. The species transplanted, mountain goats, was not in competition with other native species and numerous mining and logging roads provided good access for wildlife enthusiasts and hunters.

The impact of mining, logging, and overhunting had reduced the native population to one goat. Careful management of ongoing industrial activity and natural reclamation had revived the habitat, making it once again able to sustain mountain goats.

In August 1984, six goats were captured in a nearby area where goats were abundant. They were transported by helicopter to the Potato Mountain range. The goats accepted the mountain range as their new home, and kids have since been sighted in the area. The \$4,380 cost of the project proved a solid investment and further transplants are planned for the same area in the future.

Burrowing owls are another success story. Once common in the Okanagan Valley, this species had been in decline since the early 1900s. It is believed that many owls were shot as they perched motionless on fenceposts looking for prey. Another theory to account for the owls' demise is a shortage of burrows.

- ☐ improving spawning grounds by replacing or restoring gravel;
- ☐ building fishways which allow fish to overcome obstacles and reach spawning or rearing areas;
- ☐ constructing of new spawning channels with suitable gravel and controlled water flows;
- ☐ rehabilitating lakes by removing undesirable fish that compete with, or prey upon, game fish;
- ☐ fertilizing lakes to increase food supply for fish.

Transplants

Transplants establish indigenous wildlife stocks that have been reduced or eliminated by overhunting, the natural or human-caused destruction of habitat or the effects of severe winters. Often, a dwindling native population lacks numbers to make a comeback on its own.

The Habitat Conservation Fund sponsored 22 transplants from 1984 to 1987. These undertakings involved mountain goats, bighorn sheep, mountain caribou, burrowing owls and other species. The degree of success varies for each project.



Mountain goat and kid

caused by a decline in ground mammals such as badgers or ground squirrels. By the late 1970s, the indigenous population had all but disappeared and the owls have been registered on the B.C. endangered species list. However, studies of the Okanagan Valley revealed no reasons that the burrowing owl could not stage a revival if given the chance.

The Habitat Conservation Fund provided the money. Biologists selected an open benchland north of Osoyoos lake and created approximately 35 artificial nesting "burrows." When five families of owls were imported from Washington State, they took up residence in the free housing.

From those five families, 38 young owls were fledged during the summer of 1985. In 1986, two pairs of burrowing owls returned, each fledging one juvenile, and in 1987, a single pair returned, fledging four young. In addition, in 1987, five more

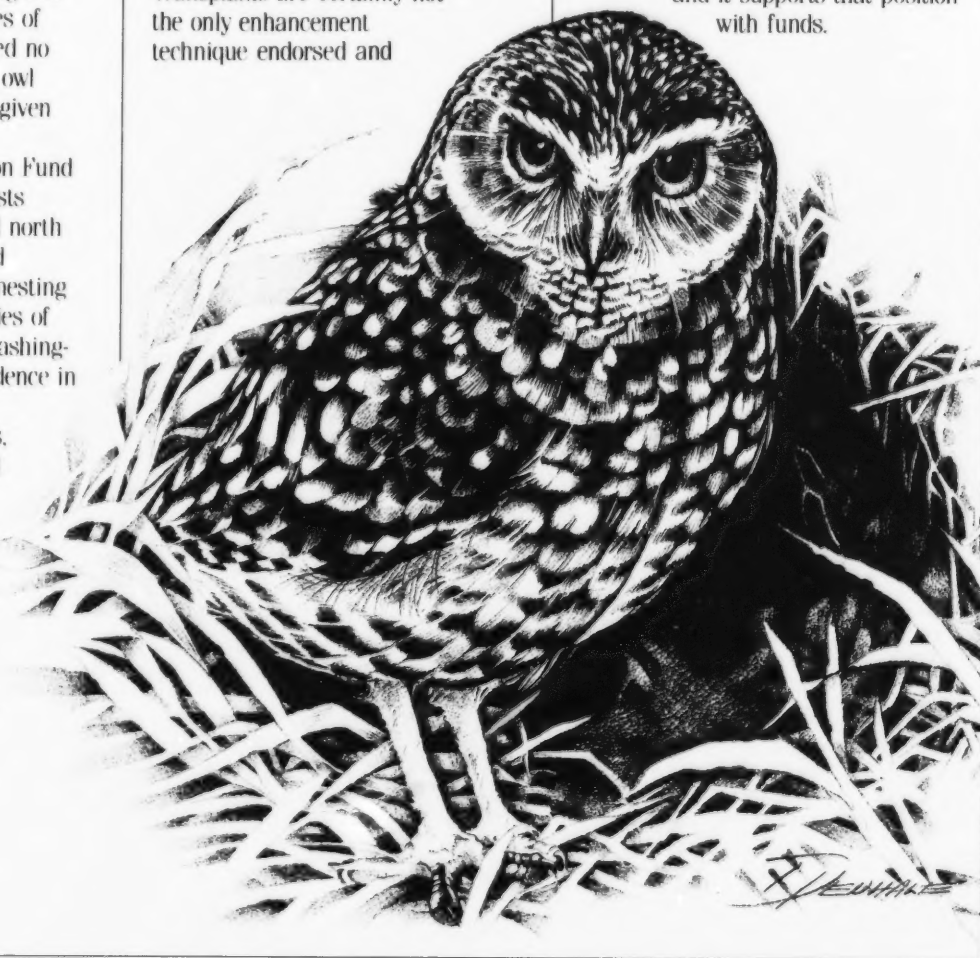
families were transplanted, fledging 26 young. Burrowing owls habitually migrate to warmer climates in the U.S. and evidence of the program's ultimate success will be in the numbers that regularly return. It is still too early to consider the project a complete success, but it has succeeded in capturing the imagination and support of many B.C. residents.

Not all transplants are successful. Sometimes, the animals return to their original area. And transplants are not the solution to all situations where a species has been depleted, but they can form a part of a much broader objective of enhancement and preservation of species. Transplants are certainly not the only enhancement technique endorsed and

supported by the Habitat Conservation Fund. Others include:

- ☐ prescribed burning to increase the quantity and quality of vegetation by interrupting the succession of other, less desirable growth;
- ☐ mechanical methods to knock down stands of maturing plants that no longer fill wildlife needs; and
- ☐ regulating water levels to improve wetland and marsh habitat, draining to provide habitat for geese and upland bird species, or flooding to enhance habitat for shorebirds and waterfowl.

The Habitat Conservation Fund is dedicated to the concept that a wide range of activities represents the best approach to enhancing wildlife habitat in British Columbia, and it supports that position with funds.



Wildlife Projects

Prescribed Burning

Burning interrupts the natural succession of forage plant vegetation from young nutritious growth to older, less nutritious vegetation. By arresting the old growth, burning sets the vegetation back to its succulent new-growth stage. This is beneficial to wildlife because it increases both quality and quantity of the food supply.

Here are the burning projects started during the past three years or continuing from earlier years. The number of each project coincides with the location of the project shown by a number on the map at the end of the report. In some cases the same number is shown in different locations. This represents different areas enhanced over a series of years by a single project.

Southern Interior Region (Thompson-Nicola)

1. Thompson prescribed burns
1981-88 (continuing) \$102,552

Kootenay Region

2. East Kootenay mule deer
1985-88 (continuing) \$76,913
3. Kootenay Lake ungulates
1984-87 (completed) \$47,958
4. East Kootenay whitetailed deer
1985-88 (continuing) \$65,510
5. Lower Columbia deer
1986-88 (completed) \$20,913

Southern Interior Region (Cariboo)

6. Cariboo mule deer shrubs
1987-88 (continuing) \$15,312

Northern Region (Skeena)

7. Thinhorn sheep
1984-88 (continuing) \$82,833



8. Chelaslie deer
1985-86 (completed) \$3,018
9. Grouse Mtn. moose
1985-86 (completed) \$2,919

Northern Region (Omineca-Peace)

10. Northern elk prescribed burns
1981-85 &
1986-88 (continuing) \$328,707
11. Dawson Creek prescribed burns
1983-88 (continuing) \$190,545
12. McLennan River moose
1984-88 (completed) \$23,667
13. Fort St. John prescribed burns
1985-88 (continuing) \$83,740
14. McBride deer
1986-87 (completed) \$4,023

Above: The Moberly Burn, a controlled fire
Left: Drip torch lighting of a prescribed burn

15. Peace River prescribed burn
1984-85 (completed) \$5,715
16. Northern deadfall prescribed burn
1984-85 (completed) \$20,678

Southern Interior Region (Okanagan)

17. Wilkinson underburn
1986-88 (completed) \$3,810
18. Ashnola prescribed burns
1981-85 &
1986-88 (continuing) \$189,592
19. Coalmont underburn
1984-85 &
1986-87 (completed) \$9,042
20. Naramata underburn
1984-85 (completed) \$1,573
21. Kettle Creek deer
1987-88 (continuing) \$23,258

Provincial project

- Fire mop-up
1986-88 (continuing) \$138,796

Dollar figure expressed for each project represents total amount expended from project inception to fiscal year end March 31, 1988.



Transplants

Moving animals to new habitats, historic ranges, or to areas prepared for them by enhancement techniques is often an effective way of re-establishing or fortifying a population. It can also extend an animal's range.

Vancouver Island Region

22. Vancouver Island Marmot
1984-85 &
1986-87 (completed) \$46,665

Lower Mainland Region

23. Sechelt elk
1986-87 (continuing) \$5,905

Southern Interior Region (Thompson-Nicola)

24. Thompson burrowing owls
1984-85 (completed) \$4,056
25. Kamloops sheep transplant
1984-85 (completed) \$123
26. Dunn Peak goat
1985-88 (continuing) \$16,629
27. Skwaam Bay bighorn sheep
1986-87 (continuing) \$3,119



Tagging Bighorn sheep for Granby transplant

Kootenay Region

28. Monashee caribou transplant
1984-85 (completed) \$19,312
29. East Kootenay bighorn
1981-88 (continuing) \$384,110

Southern Interior Region (Cariboo)

30. Potato Mtn. goat transplant
1984-85 (completed) \$4,380

31. McClinchy caribou transplant
1984-85 (completed) \$21,259
32. Chilcotin sheep transplant
1984-85 (completed) \$10,325
33. Kappan caribou
1985-88 (continuing) \$59,178
34. Moran bighorn sheep
1985-87 (completed) \$22,607

Northern Region (Omineca-Peace)

35. Bullmoose Mtn. goat transplant
1983-87 (completed) \$70,454
36. Sikanni elk
1986-87 (completed) \$3,007
37. Liard elk
1987-88 (continuing) \$10,945

Southern Interior Region (Okanagan)

38. Granby sheep transplant
1983-85 (completed) \$10,232
39. Sitkum goat transplant
1984-85 (completed) \$16,234
40. Gilpin sheep transplant
1985-86 (completed) \$36,654
41. Tulameen goats
1985-88 (continuing) \$22,251
42. Caribou monitoring
1986-88 (continuing) \$13,985
43. Okanagan burrowing owls
1983-88 (continuing) \$35,744

Treatment: Thinning, Slashing, Planting

When woody vegetation such as willow or aspen gets too mature to be useful for big game forage it is necessary to knock it down to make way for new growth which is more succulent and easily reached by animals. This is done with bulldozers or by selective logging. The younger plants which sucker up or rise independently in mechanically treated or thinned areas provide an increased quality and quantity of forage. Sometimes, it is necessary to plant such species as *Ceanothus* or other preferred animal food. In other cases treatments are directed at retarding succession or removing unproductive vegetation.

Such is the case with hardhack where clearing and soil scarification (mechanical tillage) are used to encourage vegetation that is more beneficial to wildlife.

Vancouver Island Region

- 44. Elk River Browse
1985-88 (continuing) \$18,814
- 45. Second growth forage
1985-86 (completed) \$33,144
- 46. Sayward forest elk
1987-88 (continuing) \$6,561
- 47. Salmon River elk forage
1987-88 (completed) \$3,724

Lower Mainland Region

- 48. Pitt Wetland vegetation
1984-88 (continuing) \$131,844

Southern Interior Region (Thompson-Nicola)

- 49. Eagan Lake moose range
1984-85 (completed) \$5,000
- 50. Skull Mountain mule deer
1984-85 (completed) \$7,514
- 51. Lytton elk
1984-85 &
1986-87 (completed) \$7,507
- 52. Mule deer forage
1985-88 (continuing) \$93,408

Kootenay Region

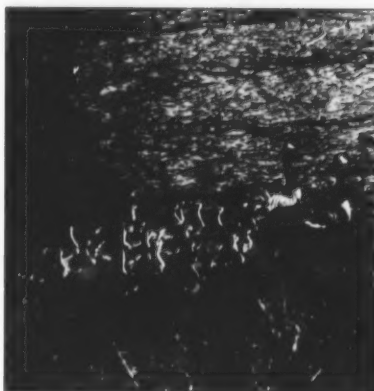
- 53. West Kootenay goats
1985-87 (continuing) \$9,157
- 54. Flathead grizzly/moose
1983-85 (completed) \$12,407
- 55. Pileated woodpecker nesting
1987-88 (continuing) \$4,767

Southern Interior Region (Cariboo)

- 56. Cariboo moose range
1983-88 (continuing) \$146,844
- 57. Junction wildlife
1981-86 (completed) \$134,404
- 58. Pine beetle salvage
1986-88 (completed) \$49,169
- 59. Chilanko uplands
1984-85 (completed) \$527



Above: Mechanical thinning of the Grove Burn
Left: Canada geese



Wetland Enhancement

Too much water, or too little, can cause problems for wildlife. Some areas must be drained to provide pasture for animals such as Canada geese or upland birds. Other areas need to be flooded for waterfowl or shorebirds such as sandpipers. Dykes, (both built and breached), dams, and pumping systems are used to control water levels. Further habitat enhancement may include sowing grass or building or improving nesting areas or removing log debris to improve marsh habitat.

Vancouver Island Region

- 65. Cowichan Estuary
1984-87 (continuing) \$51,453
- 66. Special area wetlands
1984-86 (completed) \$29,804
- Pacific Estuary Conservation Program
1987-88 (continuing) \$2,581

Lower Mainland Region

- 67. Boundary Bay raptors
1984-86 (completed) \$41,045

Northern Region (Skeena)

- 60. Bulkley Valley moose
1982-85 (completed) \$35,698
- 61. Nadina River moose
1985-86 (completed) \$24,450
- 62. Tchesinkut Lake moose
1985-87 (completed) \$20,168

Northern Region (Omineca-Peace)

- 63. Grove burn
1981-83 &
1985-88 (continuing) \$77,369

Southern Interior Region (Okanagan)

- 64. Ceanothus
1985-88 (completed) \$39,340

Southern Interior Region (Cariboo)

68. Stum Lake pelicans
1985-87 (completed) \$8,809

Southern Interior Region (Okanagan)

69. Osoyoos oxbows
1986-87 (continuing) \$24,093



Miscellaneous Category

Because wildlife is a varied and complex resource, many management activities do not fall into neat categories. A variety of other techniques are used to improve habitat.

Southern Interior Region (Thompson-Nicola)

70. Tranquille wildlife
1986-87 (continuing) \$4,540

Southern Interior Region (Okanagan)

71. Vaseux wildlife
1985-86 (completed) \$10,029
72. Toprailing
1985-87 (completed) \$16,857

Province-wide

73. UVIC Co-operative Enhancement
Projects
1984-85 (completed) \$44,000

Above: Wetland enhancement

Fisheries Projects

Stream Clearance

As fish swim upstream to spawning or rearing habitats their progress may be hampered or stopped altogether by obstacles such as log jams, beaver dams, landslides, or improperly designed or installed culverts. Removal of these obstacles or provision of new passages makes access to the desired areas possible.

Vancouver Island Region

74. Vancouver Island streams
1986-87 (continuing) \$25,863

Lower Mainland Region

75. Davis Lake
1984-86 (completed) \$21,941

Southern Interior Region (Thompson-Nicola)

76. Kamloops streams
1984-85 (completed) \$47,237
77. Natural enhancement
1987-88 (completed) \$27,934

Southern Interior Region (Cariboo)

78. Cariboo stream clearance
1981-85 &
1986-88 (continuing) \$208,970
79. Blue Lead Creek
1986-87 (completed) \$10,400

Northern Region (Skeena)

80. Kathlyn Creek
1985-87 (completed) \$7,991
81. Nlthi River
1985-86 (completed) \$4,745

Improvements to Rearing Habitat

When spawning and incubation is over and the juvenile fish appear, they need suitable conditions for rearing. These conditions can be provided in streams by creating pools, riffles, hiding and resting places through careful placement of logs or boulders. Fencing is sometimes necessary to protect rearing areas and so too, is water release from created storage. In lakes, refuge holes can be created to provide over-wintering habitat and increase survival rates of desired species.

Northern Region (Omineca-Peace)

82. Shesta Lake
1985-87 (completed) \$24,841

Southern Interior Region (Okanagan)

83. Brenda Lake storage
1986-87 (completed) \$16,382
84. Bass enhancement
1987-88 (continuing) \$32,742
85. Echo Lake dam
1987-88 (completed) \$25,041



Artificial reef for improvement of bass habitat in Osoyoos

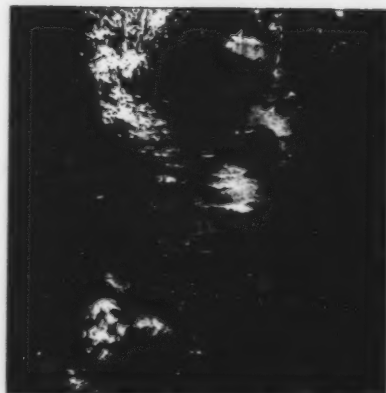
Dollar figure expressed for each project represents total amount expended from project inception to fiscal year end March 31, 1988.

Improvements of Spawning Grounds

Spawning grounds lose their usefulness to salmonids when the gravel in them is washed away or becomes covered with silt. When this occurs remedies include depositing new gravel, establishing spawning platforms, or raking and cleaning the old gravel with high pressure water jets of suction devices. Fencing is sometimes necessary to protect spawning areas and so too, is water release from created storage. Other enhancement methods such as the creation of artificial reefs have been used to improve spawning and holding areas for bass.

Lower Mainland Region

- | | |
|---|----------|
| 86. Rolley Creek
1984-85 (completed) | \$5,039 |
| 87. Fraser Valley fencing
1985-88 (continuing) | \$36,021 |
| 88. Robert Burnaby Creek
1985-87 (completed) | \$2,575 |



Improvements to rearing habitat, before and after

Southern Interior Region (Thompson-Nicola)

- | | |
|--|-----------|
| 89. Loon Creek enhancement
1985-88 (continuing) | \$129,129 |
| 90. Kamloops Lake fencing
1985-86 (completed) | \$23,070 |

Kootenay Region

- | | |
|--|----------|
| 91. Alces Lake
1986-88 (continuing) | \$74,691 |
| 92. Duck Lake bass
1986-88 (continuing) | \$30,048 |
| 93. Gerrard
1986-88 (continuing) | \$18,770 |

Southern Interior Region (Cariboo)

- | | |
|---|----------|
| 94. Kokanee Bay
1983-86 (completed) | \$30,124 |
| 95. Little Horsefly River
1985-86 (completed) | \$3,493 |
| 96. Cariboo Lakes spawning
1984-86 (completed) | \$22,471 |
| 97. Big Lake
1986-87 (completed) | \$1,620 |
| 98. Gustafson Lake gravel
1987-88 (completed) | \$971 |

Northern Region (Skeena)

- | | |
|--|---------|
| 99. Lakelse Lake
1985-86 (completed) | \$7,595 |
| 100. Seeley Creek
1985-86 (completed) | \$4,610 |

Northern Region (Omineca-Peace)

- | | |
|--|----------|
| 101. Bateman Creek gravel
1984-86 (completed) | \$39,709 |
| 102. Corkscrew Creek
1985-87 (completed) | \$59,407 |
| 103. Chubb Lake inlet control
1984-85 (completed) | \$24,656 |

Southern Interior Region (Okanagan)

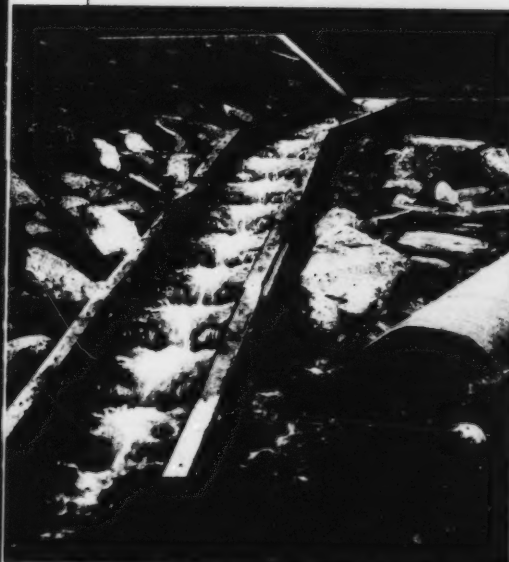
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|--|----------|
| 104. Okanagan River improvement
1984-85 & 1986-87 (completed) | \$79,976 |
| 105. Vernon Creek
1986-88 (continuing) | \$17,706 |
| 106. Peachland Creek
1986-88 (continuing) | \$14,767 |



Stream clearance

Fishways and Screening

Natural obstacles, such as waterfalls, can present barriers to upstream spawning or rearing areas. High water channels around these obstacles may exist, allowing periodic upstream access. By modifying these channels to increase consistency of water flow, fish passage and access to additional habitat may occur. When high water channels do not exist, as in hydro dams and some waterfalls, other means of access such as fishways must be found. Fishways, which consist of a series of steps or baffled compartments, provide resting areas with reduced water velocities. Fishways allow passage for more agile gamefish while acting as barriers to undesirable species. Screens prevent gamefish from going into undesirable waters such as irrigation ditches



Above: Spawning channel built at Kokanee Creek
Centre: Fish ladder

where they may become trapped. These devices also prevent coarse fish from invading spawning and rearing areas of desirable species.

Vancouver Island Region

- 107. Elk-Beaver Lake enhancement
1987-88 (continuing) \$10,487
- 108. Gordon River falls
1987-88 (completed) \$9,000

Lower Mainland Region

- 109. Salmon River pumphouse
1985-87 (continuing) \$9,252

Kootenay Region

- 110. Blackwater Creek
1985-86 (completed) \$9,513

Southern Interior Region (Cariboo)

- 111. Mit Creek
1986-87 (completed) \$370

Southern Interior Region (Okanagan)

- 112. Powers Creek fishway
1986-87 (completed) \$10,649
- 113. Powers Creek screening
1986-87 (completed) \$4,636

Artificial Spawning Channels

Sometimes existing natural spawning streams are insufficient to support desired fish populations. To overcome this, new channels are built next to existing streams. These new channels with suitable gravels and a controlled water flow help ensure maximum production of juvenile fish.

Kootenay Region

- 114. Whiteswan Lake channel
1981-85 (continuing) \$50,691
- 115. Meadow Creek
1983-87 (completed) \$284,559
- 116. Kokanee Creek channel
1984-88 (completed) \$102,985

Southern Interior Region (Cariboo)

- 117. Hanceville fencing
1985-86 (completed) \$4,778

Coarse Fish Control, Transplants and Fertilization

Sometimes undesirable coarse fish become so numerous in a lake they reduce gamefish populations through competition or predation. A carefully planned and administered pesticide program can be carried out to reduce the coarse fish population before the lake is restocked with desirable species. Barriers are sometimes used to control coarse fish movements. These operations are all controlled by both federal and provincial government legislation. Other lakes require fer-

tilization to improve growing conditions while still others require the stocking of gamefish.

Lower Mainland Region

- 118. Salsbury Lake fertilization
1985-88 (continuing) \$36,465

Southern Interior Region (Thompson-Nicola)

- 119. Kane Valley Lakes rehabilitation
1983-84, 1986-87 (completed) \$103,735
- 120. Deep Lake rehabilitation
1987-88 (completed) \$1,509

Kootenay Region

- 121. Champion Lakes rehabilitation
1984-87 (completed) \$45,864
- 122. Summit Lake rehabilitation
1985-87 (completed) \$122,266
- 123. Cherry Lake rehabilitation
1984-85 (completed) \$40,578
- 124. Klakho Lake
1985-88 (continuing) \$63,208
- 125. Echo Lake rehabilitation
1986-87 (completed) \$28,174
- 126. West Arm fertilization
1985-88 (continuing) \$251,755

Southern Interior Region (Cariboo)

- 127. Puntzi Lake
1984-87 (completed) \$29,868
- 128. Till Lake coho
1984-87 (completed) \$40,867

Northern Region (Skeena)

- 129. Divison Lake inlet
1983-85 (completed) \$7,469
- 130. Dunalter Lake rehabilitation
1985-87 (completed) \$20,390

Northern Region (Omineca-Peace)

- 131. Sukunka River
1986-87 (continuing) \$23,453
- 132. Charlie Lake forage fish
1985-87 (completed) \$23,081
- 133. Cameron Lake
1987-88 (continuing) \$6,748

Southern Interior Region (Okanagan)

- 134. Holstein Lake
1985-86 (completed) \$9,453
- 135. Burnell/Ripley Lakes
rehabilitation
1986-87 (completed) \$14,380
- 136. Allison Lake barrier
1984-85 (completed) \$8,396

Lake Aeration— Artificial Circulation

When lakes suffer a shortage of oxygen, action must be taken to increase oxygen supplies—otherwise fish die-off will occur. Oxygen-rich fresh air is pumped into the lakes causing the lower depth water to recirculate to the surface where it is exposed to fresh air. Diversion of water into a lake can also help the aeration process.

Vancouver Island Region

- 137. St. Mary's Lake aeration
1984-87 (completed) \$139,699
- 138. Glen Lake aeration
1984-86 (completed) \$36,976

- 139. Glen/Langford Lakes evaluation
1985-87 (completed) \$11,474

Southern Interior Region (Thompson-Nicola)

- 140. Kamloops Lakes aeration
1981-85 (completed) \$169,107
- 141. Dairy Creek diversion
1985-86 (completed) \$22,988

Kootenay Region

- 142. Johnson Lake aeration
1985-86 (completed) \$20,764
- 143. Ha Has Lake aeration
1984-86 (completed) \$36,906
- 144. Solar Aeration
1986-87 (completed) \$27,767
- 145. Enid Lake
1987-88 (completed) \$9,038

Northern Region (Omineca-Peace)

- 146. Inga Lake aeration
1984-85 (completed) \$10,269
- 147. Beaver Lake
1986-87 (completed) \$24,294

Southern Interior Region (Okanagan)

- 148. Burnell Lake
1984-85 (completed) \$6,352

Miscellaneous Projects

Some projects encompass several techniques required to solve a particular fisheries problem.

Southern Interior Region (Cariboo)

- 149. Till/Forest Lakes gravel
1984-85 (completed) \$3,187

Northern Region (Skeena)

- 150. Round Lake spawning platform
1985-87 (completed) \$8,571



Enhancement Planning

Enhancement involves inventory, monitoring, feasibility studies, and general planning to provide the basis for future habitat management and enhancement.

Fisheries

Vancouver Island Region

151. Cowichan River side-channel
1986-87 (completed) \$10,000

Lower Mainland Region

152. Lower Mainland feasibility
1987-88 (completed) \$8,220

Northern Region (Omineca-Peace)

153. Omineca feasibility
1986-87 (completed) \$40,833
154. Francois Lake
1987-88 (continuing) \$19,610

Southern Interior Region (Okanagan)

155. Okanagan Lakes planning
1984-85 (completed) \$3,127

Kootenay Region

156. Rehab. Potential small lakes
1987-88 (completed) \$7,665

Wildlife

Vancouver Island Region

157. Young forest winter range
1986-87 (completed) \$63,534
158. Vancouver Island marten
1986-88 (continuing) \$18,427

Southern Interior Region (Thompson-Nicola)

159. Cavity nesting birds
1984-85 (completed) \$5,503

Southern Interior Region (Okanagan)

160. Spotted bat
1987-88 (completed) \$8,900

Kootenay Region

161. East Kootenay curlew
1985-88 (continuing) \$15,075
162. Kootenay caribou plan
1987-88 (completed) \$6,646

Southern Interior Region (Cariboo)

163. Cariboo River enhancement
1985-88 (completed) \$28,890

Northern Region (Skeena)

164. Klappan Stone's sheep
1984-85 (completed) \$7,998
165. Tweedsmuir caribou
1986-87 (completed) \$18,738
166. Charlotte's raccoon-seabird
1987-88 (completed) \$4,300
167. Marten habitat evaluation
1987-88 (continuing) \$5,601

Northern Region (Omineca-Peace)

168. Nechako enhancement plan
1985-86 (completed) \$23,738
169. Murray-Cheslatta
1987-88 (completed) \$24,334

Technical Development

Some projects do not fall into one of the foregoing categories, yet are essential to the long-term well being of Fund operations. An example of such a project is the development of technical standards for monitoring guidelines.

Wildlife

170. Elk trap construction
1985-86 (completed) \$9,258
171. Willow identification guide
1986-87 (completed) \$15,516
172. Prescribed burning
monitoring guide
1985-87 (continuing) \$21,034

Public Use

Fish and wildlife must be seen to be enjoyed. Often, enhancement projects occur near urban centers or along roadways. With suitable viewing facilities they present an opportunity for educational and recreational enjoyment. Trails and observation towers supplemented by interpretative material promote the enjoyment of fish and wildlife. Nesting structures and artificial habitats also help make viewing more accessible.

Public use and education

173. Information kit
1985-86 (completed) \$16,425
Public relations
1981-88 (continuing) \$34,964
Wildlife centennial
1986-87 (completed) \$10,000

Fisheries

Victoria office

- Continuing annual
maintenance support
1986-88 (continuing) \$81,685

Lower Mainland Region

174. Urban stream education
1986-88 (completed) \$22,118

Southern Interior Region (Thompson-Nicola)

175. Film—Releasing Fish Alive
1986-88 (continuing) \$21,644

Southern Interior Region (Okanagan)

176. Okanagan Lake media pkg.
1987-88 (completed) \$19,933

Wildlife

Vancouver Island Region

177. Cowichan demonstration forest
1986-87 (completed) \$13,982

Lower Mainland Region

178. Pitt public use
1986-87 (continuing) \$44,309

Kootenay Region

179. Creston Valley education
1987-88 (completed) \$9,920

Northern Region (Omineca-Peace)

180. Landowner's guide
1985-86 (continuing) \$8,978
181. Peace River nestbox Program
1985-87 (continuing) \$7,564

Administration

Money is allocated to facilitate project and policy development of the Fund and also for expenses of the Public Advisory Board.

Fund Administration

- Public Advisory Board
1981-88 (continuing) \$63,676
- General administration
1983-87 (continuing) \$151,376
- Policy manual
1984-85 (completed) \$4,341



Donations and Fund Raising

While most of the Fund's money comes from the surcharge on various fishing, hunting, trapping, and guiding licences, an appreciable amount comes from donations and bequests. All donations and bequests are deposited directly to the Fund and are tax deductible.

For more information about how you can contribute to this worthwhile conservation program write:

Habitat Conservation Fund
Ministry of Environment
Parliament Buildings
Victoria, B.C.
V8V 1X5

or phone (604) 387-9769

CREDITS

PHOTOGRAPHY:

We wish to acknowledge those who kindly provided photographs for this report.

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Habitat Conservation Fund

Statement of Cash Receipts and Disbursements

For the Fiscal Years Ended March 31, 1982, 1983, 1984, 1985, 1986, 1987 and 1988

	1982	1983	1984	1985	1986	1987	1988
The Enhancement Account							
Opening balance	—	141,693	96,225	847,616	1,110,179	1,188,579	734,175
Receipts:							
Start-up advance	711,799	—	—	—	—	—	—
Licence surcharges	141,593	1,386,623	1,420,428	1,422,547	1,377,703	1,409,320	1,453,621
Donations, bequests	100	808	2,154	1,686	2,373	920	1,395
Grundle Art Project	—	—	18,046	2,834	1,340	244	333
Interest	—	9,398	60,972	143,427	113,354	86,175	64,394
	853,492	1,538,522	1,597,825	2,418,110	2,604,949	2,685,238	2,253,918
Disbursements:							
Enhancement projects	711,799	730,498	750,209	1,307,931	1,416,370	1,951,063	1,434,614
Repayment of advance	—	711,799	—	—	—	—	—
	711,799	1,442,297	750,209	1,307,931	1,416,370	1,951,063	1,434,614
Closing balance	141,693	96,225	847,616	1,110,179	1,188,579	734,175	819,304
The Acquisition Account							
Opening balance	—	—	—	—	—	—	—
Receipts:							
Crown Land Fund Transfer	770,409	203,859	—	—	—	—	—
Disbursements:							
Acquisition Projects	770,409	203,859	—	—	—	—	—
Closing balance	—	—	—	—	—	—	—
The Compensation Account							
Opening balance	—	—	—	273,584	291,028	300,970	330,991
Receipts:							
Highland Valley	—	—	250,000	—	—	—	—
Interest	—	—	23,584	28,587	27,534	27,021	28,433
Brenda Mines	—	—	—	—	25,000	—	—
Pacific Northwest	—	—	—	—	2,000	—	—
Miscellaneous	—	—	—	—	—	3,000	—
	—	—	273,584	302,171	345,562	330,991	359,424
Disbursements	—	—	—	11,143	44,592	—	53,423
Closing balance	—	—	273,584	291,028	300,970	330,991	306,001

